



WATER & POOL&FLOOR HEATERS

OWNER'S MANUAL

Including Installation Instructions and Warranty Information

**To Suit 2.7kW
HEAT PUMP POOL&FLOOR & WATER HEATERS**

MODELS

27ACP-407

27ACP2-22

27ACP2-407

27ACW-417

27ACW-417B

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Section 1: APPLIANCE DETAILS

For future convenience, please fill in the following details and retain with your original invoice.

1a: Owner's Details

Surname : Given Name(s) :

Address :

Town/Suburb :

State/Territory : Postcode :

Date of Purchase :

Purchased From :

Model : Serial Number :

Date of Manufacture :
(Details on Data Plate on water heater)

1b: Installer's Details

Date of Installation : Installer's Name :

Address :

Installer's Signature :

1c: Service History

Date of Service : Serviced By :

Work Carried Out :

Signature of Service Agent :

Date of Service : Serviced By :

Work Carried Out :

Signature of Service Agent :

Section 2: INTRODUCTION

Quantum Energy Technologies

2a: One Of The World's Most Energy Efficient Methods Of Water Heating

Congratulations on your purchase of a Quantum Energy Technologies Pool or Floor or Water Heater. Proper installation and service of your new heating system and correct chemical maintenance of the water will ensure many years of low cost heating.

QUANTUM ENERGY TECHNOLOGIES Pty Ltd designs and manufactures energy efficient Heat Pump water heaters. The simplest way to explain the advantage of this heater is that it saves energy in any weather, even at night. The system can save up to 75% of the energy typically used by conventional pool or building heating systems; greatly reducing heating costs.

As the name indicates, a Heat Pump is a machine that pumps heat from a low temperature source to a high temperature reservoir. It has a cold side to absorb heat at low temperatures and a hot side to deliver heat at high temperatures.

In the Quantum Pool or Floor or Water Heater, the cold side of the refrigeration circuit is an air conditioning coil. This coil absorbs the heat from the air that is forced through it by means of the fan.

QUANTUM water heaters can save energy in countries all around the globe. They are used in all weather conditions for domestic, commercial and industrial applications, and are regarded as one of the most energy efficient water heaters in the world. This is your assurance that you have purchased one of the highest quality water heaters available, one that will provide pool or building heating safely, economically and for many years to come.

Warranty Return Card

Enclosed you will find a warranty card - please fill in the details and return immediately. This will ensure prompt service under warranty, if required. See section 6 for terms of warranty.

2b: Application Note For Pool Heaters - Heat Loss

About 50% of all the energy lost from a pool is from the surface of the water. If the pool is enclosed or uses a pool cover / blanket then the size and cost of the pool heater, as well its running costs will be reduced. The higher the temperature that the pool water has to be heated to, the greater is the rate at which heat energy is needed to heat the pool water. This will mean higher operating costs.

Section 3: HEAT PUMP OPERATION

3a: Quantum Heat Pump Pool /Floor/Water Heater

The heat pump pool heater developed by Quantum is an extremely efficient method of heating a swimming pool, floor, water or similar application. This new technology combines the direct energy gain of an air-sourced evaporator with the constant heat requirement of a high performance heat pump.

The main components of the Quantum heat pump pool or floor heating system are: -

- High efficiency heat exchanger (as hot side condenser)
- Air sourced fin coil (as evaporator)
- Thermostatic expansion valve
- Efficient rotary compressor

The heat exchanger for *pool* heating is made with *Titanium* especially suitable for chlorinated pool water.

The system uses the commonly available R22 or R407C or R417A refrigerant.

The 2.7kW Quantum pool heater is designed for domestic use but can also be used on smaller commercial applications.

The Quantum heating system produces an operating sound of a similar type and level to the outdoor unit of an air conditioner.

3b: Principle Of Operation

There is a flow switch installed which detects water flow through the heat exchanger. The Digital Controller has a time delay at start, this time delay is set at 10 minutes. Once water pressure has been detected, the Digital Controller will begin its time delay period. Heat pump operation will commence after the time delay period has completed.

The time delay is also activated when any protection device restarts the system, including the Digital Controller. The unit will be turned on or off by the Digital Controller, as part of normal operation, in accordance with the water temperature and the set point of the Digital Controller. When the Digital Controller, sensing a low water temperature, calls for the unit to restart, the time delay will again be activated and the compressor will not begin operation until completion of the time delay period.

Within 5 minutes of operation, the system will stabilise and it should be possible to observe a temperature difference between the water inlet and outlet of approximately 4° C to 6° C, depending on the ambient temperature.

3c: Digital Controller

3c.1: Description

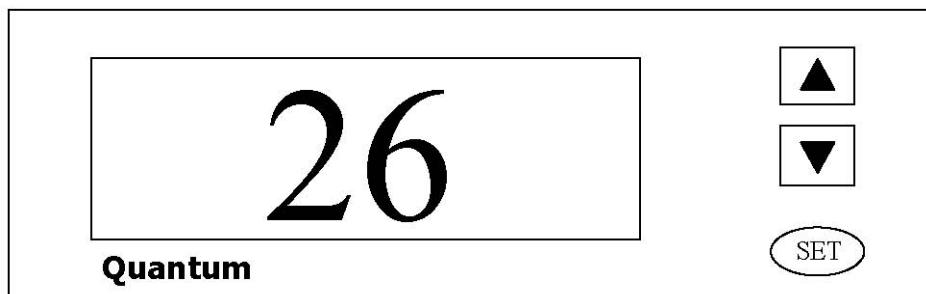
The sophisticated Digital Controller (thermostat) provides temperature readout and set point temperature adjustment. It also monitors compressor operation, controls the de-icing system and indicates the operational status of the heater.

3c.2: Temperature Display

The temperature display indicates water temperature in the inlet of the heater (for pool heating) or the outlet (for water heating). Therefore the water circulation pump must be operating for an accurate water temperature to be displayed. If all safety devices are closed except for the water flow pressure switch, the temperature display will operate. Once water flow commences the system will be able to detect the circulating water temperature.

During operation, the display will indicate the actual water temperature. To show the desired water temperature press the “SET” button 3 times, the display is now showing the temperature set point. To then go back to the actual water temperature display, press the “SET” button again. To change the desired water temperature, press the “SET” button 3 times, then, using the arrow up or arrow down buttons, program the desired water temperature. Finally press the “SET” button again to lock in the new setting and display the actual water temperature once more.

Figure 1: Digital Controller Panel Layout



3c.3: The Buttons

Use In Conjunction With The Layout Diagram Figure 1.

3c.4: Set Button

- a) To enter the settings mode, press the **SET** button **3 times**; the display will show H26, this is the water temperature cut out set point. Pressing the **UP** or **DOWN** button will adjust the set point from 20°C to a maximum setting of 40°C (Pool /Floor Heater) or 60°C (Water Heater)
- b) If display shows “**OFF**” press & hold the **SET** button (hold for 6 seconds) to cancel this mode.
- c) Pressing the **SET** button and holding for 6 seconds will perform a manual reset of the system if required i.e. after a 105°C Thermal Trip. Turning power off to the system, then back on will also reset it.

3c.5: Up Button

- a) This key is used to raise a setting after selecting the required programming mode as in section 3c.4.
- b) When the display is in normal mode, press **3 times** to display **Axx** (the compressor temperature). Push again to display **bxx** (evaporator temperature) or again for **Cxx** (ambient temperature).
- c) During the time delay start period (display in normal mode), press & hold for **3 seconds** to force a compressor start. When the compressor is running, press & hold for **3 seconds** to force a compressor shutdown.

3c.6: Down Button

- a) This key is used to lower a setting after selecting the required programming mode as in section 3c.4.
- b) When display is in normal mode, press & hold for **3 seconds** to simultaneously open the de-ice valve and liquid injection valve; the valves will close 10 seconds later.
- c) When compressor is running (display in normal mode), press **3 times** to display the Amperage being drawn **Cxx**.

3c.7: Restore Factory Programming

To restore the digital controller's factory settings, turn off the power to the system. Press the **SET** button and hold while turning the power back on.

To exit any level press the **SET** button to cycle through all menu items until the controller returns to the water temperature display once again.

3c.8: Error Codes

E01 Water temperature sensor open or short circuit. Auto reset.

E02 Compressor temperature sensor open or short circuit. Auto reset.

E03 Evaporator temperature sensor open or short circuit. Auto reset.

E04 Compressor overload protection. Auto reset the first time, manual reset the second time.

E05 Compressor overheat protection (exceeding H105 setting). Auto reset.

E06 Compressor overheat protection (exceeding 105°C). Manual reset.

E07 High / Low pressure protection. Auto reset.

E08 Ambient temperature sensor open or short circuit (Optional). Auto-reset.

E09 Water pressure / flow protection. Auto reset.

Section 4: INSTALLATION DETAILS

4a: The Four Major Installation Steps Required

1. Installation / locating of the unit
2. Plumbing of the heat exchanger unit to the pool / building
3. Electrical connections
4. Commissioning

4b: Installation Of The System

4b.1: Location

The 27AC series heat pump is suitable for exterior installation only. It is to be mounted on solid ground or on a firm structure if elevated. The location should be dry and not subject to flooding at any time from either pool overflow or storm water etc. The heat exchanger unit contains live electrical wiring when the power has been switched on to it.

SAFETY NOTE: The selected location should be away from children's play areas or be isolated from them by appropriate fencing or enclosure to ensure access is not possible to the unit.

4b.2: Plumbing Work To The Unit

The actual plumbing of the hydraulic circuit to the heater does not form part of Quantum's supply and is the owner's responsibility. For pool heating, a fully qualified pool plumber or pool installation company should be engaged to do this part of the work. For floor heaters a qualified plumber, familiar with hydronic type building heating, will be required. The water connections to the inlet and outlet of the heater are 40mm PVC barrel unions for pool heater or copper for floor and water heaters. The Inlet and Outlet fittings are labelled on the cabinet.

4b.3: Heat Exchanger Must Be Plumbed Up Stream From The Sanitation System

For pool heating, the heat exchanger **MUST** be installed before (up stream from) the sanitisation system not after (down stream) – see figures 3 & 4. This is to avoid high concentrations of sanitiser being passed through the heat exchanger, which may corrode it and void the warranty.

4b.4: No Requirement For External By-Pass (Pool Heaters)

As shown in Figures 5 & 6, the pool heater has an internal by-pass so there is no requirement for external flow regulation to be fitted. The units can be installed in this manner on either an existing filtration system or an isolated suction and return.

4b.5: Water Flow Rate

The flow rate for the heater is between 40 and 90 litres per minute. The flow rate to the heat exchanger of the heater is automatically adjusted by the water regulating valve (on 27ACP2 pool heaters) to achieve appropriate water temperature rise between the water inlet & outlet.

4b.6: Chemical Balance

It is imperative that correct chemical balance be maintained in your pool or building hydraulic circuit. Corrosion due to imbalanced water will void warranty. Your local pool shop specialist or spa retailer can advise on correct water balance. We recommend that your pool water should be checked and maintained regularly by a pool water professional. As a guide the following parameters may be used.

PH 7.6 to 7.8

Total Alkalinity 80 to 120 p.p.m.

Calcium Hardness 150 p.p.m.

You should test your water balance at least on a weekly basis.

Excessive sanitiser can damage your heater. Chlorine should not exceed 3 p.p.m. and bromine should not exceed 5 p.p.m. Salt Chlorinators on indoor or covered swimming pools or spa pools can easily produce excessive chlorine levels, which will damage the heater internals.

4b.7: Cabinet Clearances

Note: Quantum recommends allowing the following clearances around the Heat Exchanger Cabinet: -

MODEL	FRONT	BACK	LEFT SIDE	RIGHT SIDE	TOP
27AC Series	1,700 mm	300 mm	500 mm	500 mm	500 mm

The heater should be placed on a plinth if installed on a floor subject to wet conditions or outdoors. A properly drained overflow tray should be used where property damage could occur from water spillage. (See AS3500.4 for further details).

Figure 2: Dimensional Drawing for 2.7kW Pool & Floor & Water Heater

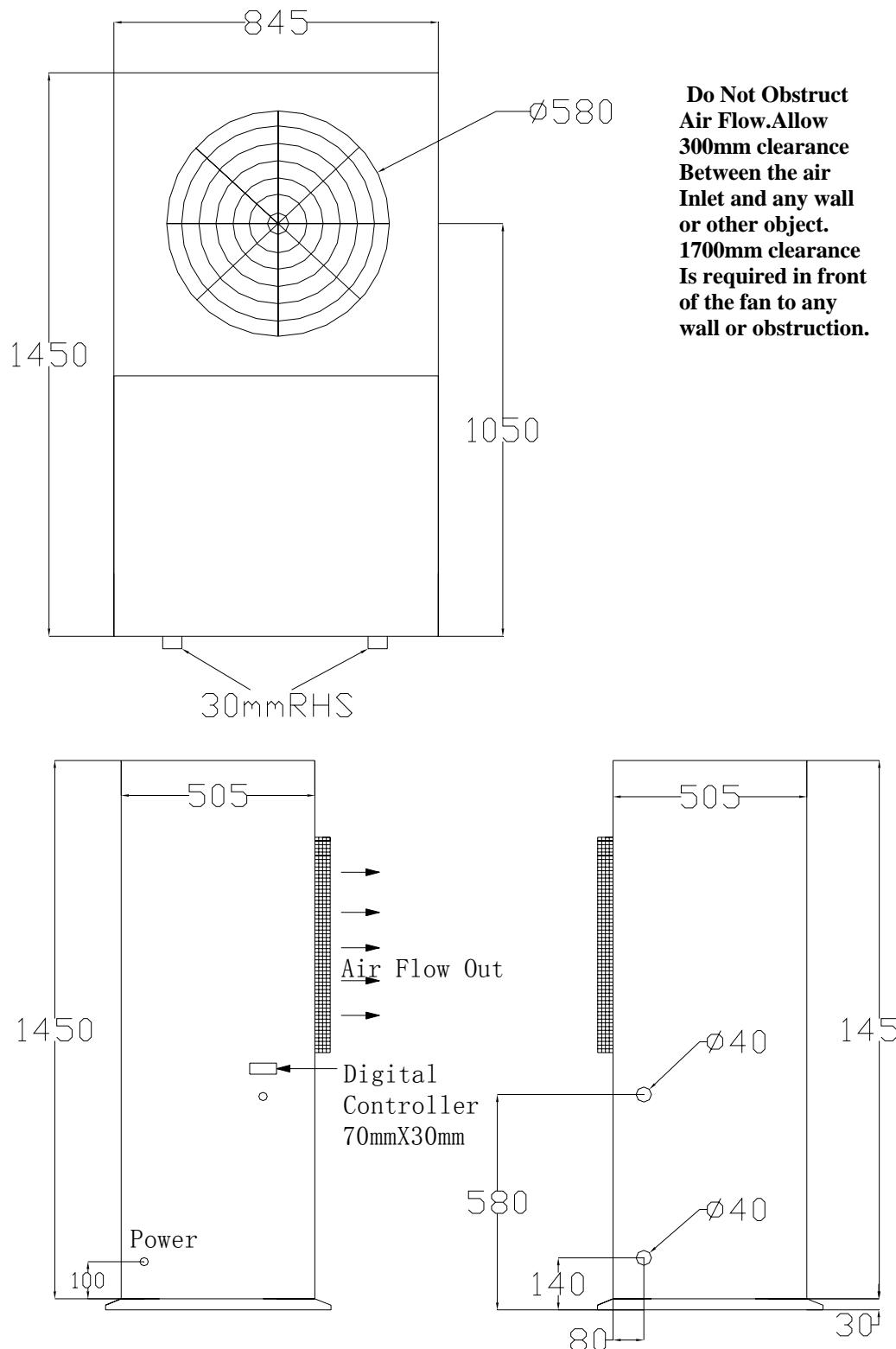
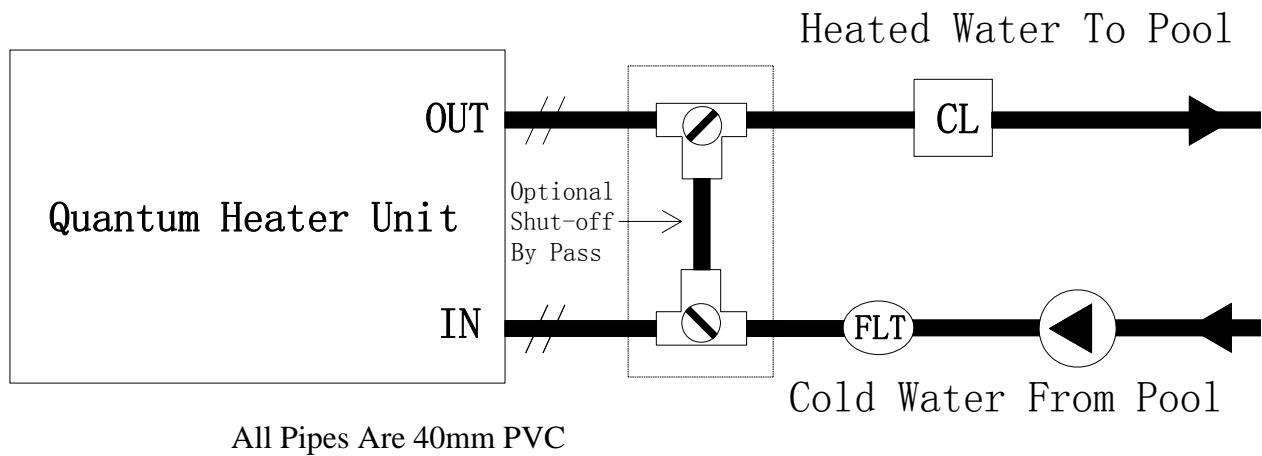


Figure 3: Hydraulic Connections To Heater

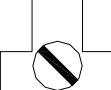
Showing shut-off by-pass valves (Optionally fitted by plumber to isolate the heater)

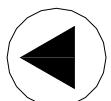
**Important Note**

Pool Heaters have an internal automatic by-pass system and do not require the external by-pass for operation. However, if desired, an external by-pass can be plumbed in for use if the heater is disconnected or to isolate it from the hydraulic circuit. In this way water would still flow but not through the heater unit. When the heater is in operation, this by-pass **must not** be used i.e. the 3 way valves must be set to channel the full flow through the heater unit and nothing via the external by-pass.

LEGEND

// Barrel Unions

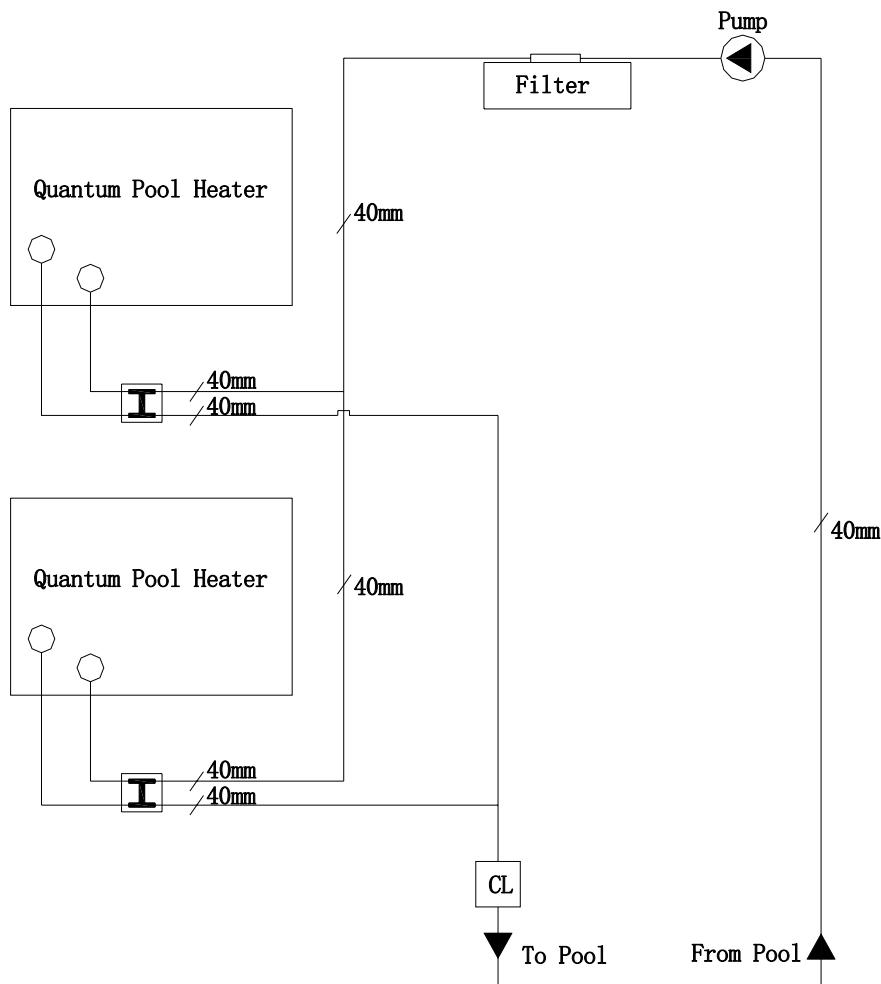
 3Way Isolating Valves (Optional)

 Water Circulation Pump Suggest 0.5 HP

 CL Chlorinator

 FLT Pool Filter

Figure 4: Schematic Of Two Pool Heaters In One Filter Circuit

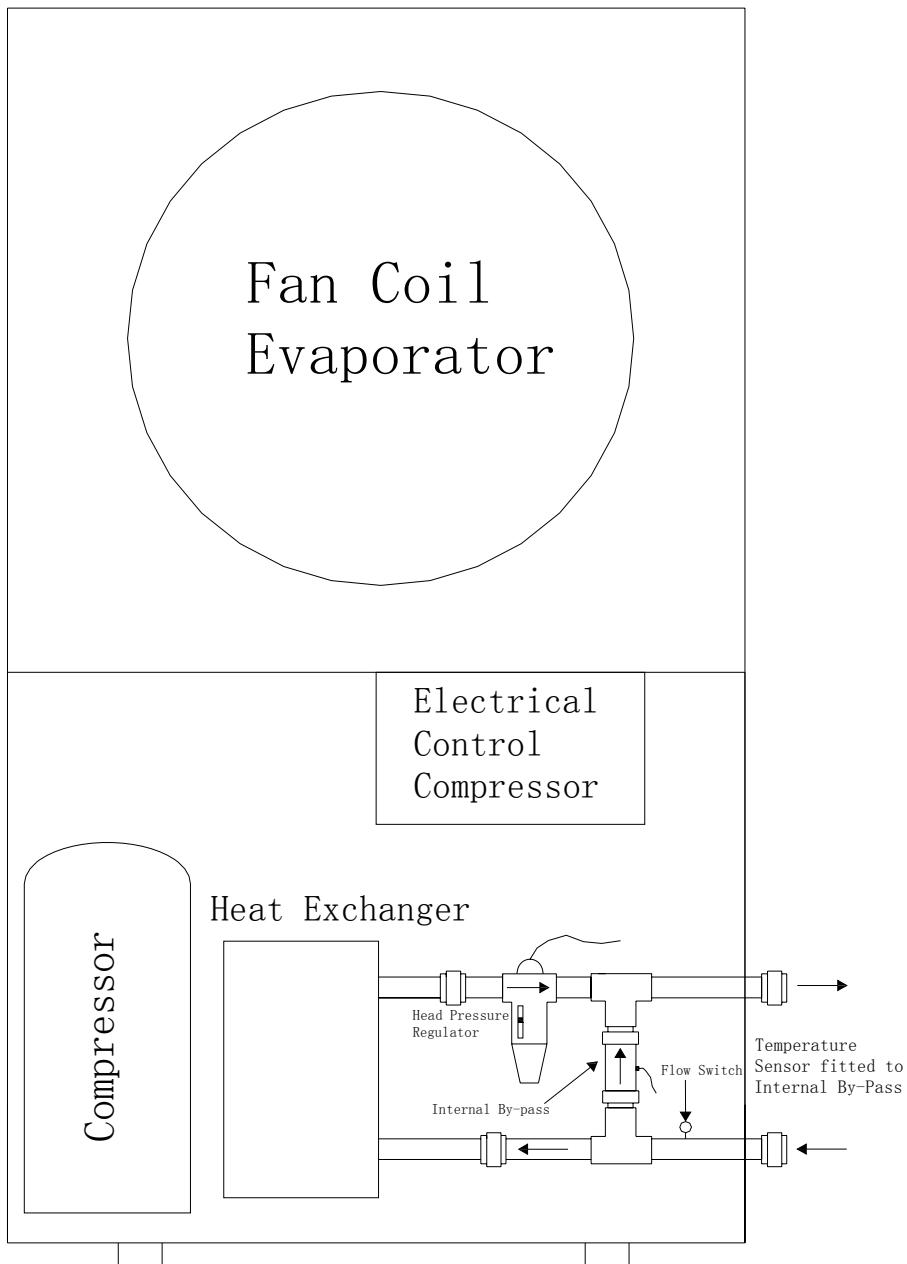


Size of the water circulation pump & filter is to be selected by the client

Quantum does not supply any plumbing – parts or labour

LEGEND	
I	3 Way Isolating Valves (Optional)
Water Circulation Pump Suggest 0.5 HP	
CL	Chlorinator

Figure 5: Schematic Of Internal By-Pass (Not On Water Heater Version)



4b.8: Electrical Connection

This heater is designed for single-phase 220/240V AC supply only. A circuit breaker must be installed at the power supply and the electrical connection must comply with Local Supply Authority Regulations and AS3000. It will require an approved, standard 240V 25A On / Off switch in close proximity to the heater. Faulty wiring may void warranty if damage has been sustained to the compressor from faulty or sub-standard wiring.

The specifications of the Australian Standard states that where an appliance is intended for outdoor use (IPX5), it is not permitted to supply a power cord and plug. Therefore the owner will need to employ a qualified electrical tradesperson to fit a 25A cable (suitably sheathed for exterior use) with weatherproof electrical connector or plug to the unit.

A certified electrician must carry out all electrical work according to the local standards and regulations. A separate circuit breaker is recommended for each unit in the case of multiple installations. The power supply rating for the unit is 220-240V AC50Hz 25A.

Note: This water heater is fitted with a Digital Controller (thermostat) incorporating an over-temperature energy cut out. Under no circumstances should the pool heater be operated without this device being in the circuit. Only a qualified electrician or the manufacturer should carry out replacement.

4b.9: High & Low Pressure Switch Cut Out Settings

Pressure Switch	Setting	Differential Setting
Low Pressure	50 kPa Cut Out	100 kPa
High Pressure	2,800 kPa Cut Out	400 kPa

IMPORTANT

This appliance is not intended for use by young children or the infirm without supervision – young children should be supervised to ensure that they do not play with the appliance.

4c: Commissioning

Once all electrical and water connections have been correctly completed, commissioning can begin.

4c.1: Temperature Rise Across Heat Exchanger

When carrying out the commissioning the expected temperature rise across the heat exchanger would be between 4°C & 6°C on an ambient temperature of 20°C. Discharge pressure should be between 1300 kPa & 1500 kPa when this temperature rise is achieved.

Section 5: MAINTENANCE AND SERVICE INFORMATION

Your Quantum heater is a completely sealed refrigeration system, similar to a household refrigerator. The maintenance program to be employed on your Quantum is not much different to that required for the maintenance of a standard electric water heater. However, the Quantum **warranty may be void if any of the following conditions are not met** or if the refrigeration lines or components are damaged or altered in any unauthorised way.

5a: Air Evaporator Coils

It is important that the air inlet and outlet vents are kept clear. Restriction of air-inlet or outlet vents may void warranty if the system has been damaged due to insufficient airflow. The Fin coil must be checked regularly and any debris build up (such as leaves etc) removed.

The system uses an evaporator coil to extract heat from the air. The coil is extremely efficient in warm humid weather; however, as temperatures drop to ten degrees or less the coil will begin to collect ice. The coil has been designed with "heat injection" for defrosting. During the "heat injection" process the fan may turn off, this is normal as the pool & building heaters are designed to fight ice build up, in cold or freezing weather.

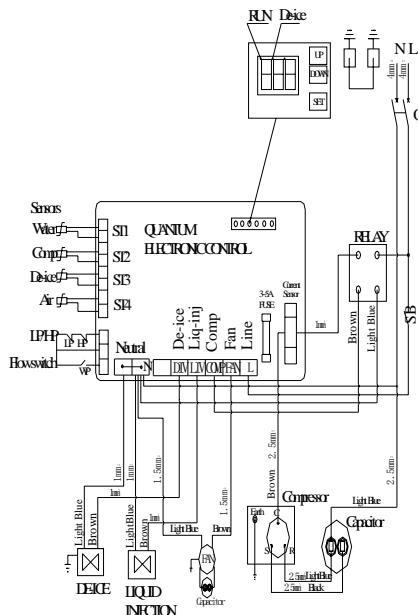
5b: Special Note On Heat Exchanger

The heat exchanger **MUST** be installed before (up stream from) the sanitisation system not after (down stream) – see figures 3 & 4. This is to avoid high concentrations of sanitiser being passed through the heat exchanger, which may corrode it and void the warranty.

SERVICE CAUTION

Before any electrical components are inspected **the System MUST be turned off** at the power point / mains supply. Do not touch wiring or any electrical components without supervision or training to Australian (or equivalent) standards.

Figure 7: Wiring Diagram



5c: Table Of Parameters

PARAMETER	Models			
	27ACP-407	27ACP2-22 27ACP2-407	27ACW-417	27ACW-417B
Width Over All	845 mm		845 mm	
Depth Over All	510 mm		510 mm	
Height Over All	1480 mm		1480 mm	
Weight	150 kg	155 kg	155 kg	165 kg
Noise Level	62dBA		62 dBA	
Water In / Out	DN 40 mm PVC Union		DN 40 mm Copper Union	
Power Supply	240v 50Hz		240v 50Hz	
Supply Amps	25		25	
Power Input	2.81 kW		2.87 kW	
Water Flow	40 – 90 LPM		30 – 50 LPM	

- Specifications subject to change without notice.
- Performance rated at 26.7°C average / 63% RH 26.7°C entering water temperature for pool heating; and 20°C ambient for water heating.

Section 6:WARRANTY DETAILS FOR POOL/FLOOR HEATER

MANUFACTURED BY QUANTUM ENERGY TECHNOLOGIES PTY LTD

6a: Terms Of Warranty

QUANTUM ENERGY TECHNOLOGIES PTY LTD (the Company) WARRANTS "THIS QUANTUM ENERGY SYSTEM" (the unit) against faulty workmanship, materials and defects in manufacturing. THE HEATER CARRIES A FIVE (5) YEAR LIMITED WARRANTY. Details as shown below:

1. Warranted for a period of five (5) years from the date of installation. This is limited to the evaporative fan coil and motor, heater cabinet, internal PVC piping and Unions.
2. Refrigeration pipe work, refrigeration valves, compressor, heat exchanger, electrical components including thermostats, solenoids, wiring and controls are warranted for a period of two (2) years from date of installation
3. Labour, delivery and / or transportation: - Where the Company considers it necessary to repair or replace any component part covered by the warranty, the consequential labour, delivery and / or transportation services will be provided free of charge to the owner within a fifty-kilometre radius from where the unit was purchased. Customers outside this area will be subject to freight and travelling charges incurred by the distributor carrying out the work. The date and time of the commencement of such warranty work will be at the discretion of the Company. Quantum does not warrant that such repair work will take place within any particular period. A call out fee applies to any warranty calls made outside normal QUANTUM business hours.

The Company's liability under this warranty shall be limited to the free replacement or repair of any defective component parts of the unit and shall not cover any consequential loss or damage arising out of any such defect.

**NOTE: Corrosion of the heat exchanger is caused by improper water quality / PH balance.
Corrosion of this nature will void all warranties.**

THE WARRANTY SHALL NOT APPLY IN ANY OF THE FOLLOWING EVENTS:

1. The unit is installed by an installer not having adequate technical skills or training to perform the task;
2. Where alterations, addition or repairs to the unit are carried out by persons unauthorised by the Company;
3. Accident or in the opinion of the Company, misuse and / or abuse of the unit;
4. Where the loss or damage is in the opinion of the Company due to the failure to install, operate and / or maintain the unit in accordance with any of the directions contained in the Owner's Manual.

THIS WARRANTY DOES NOT COVER LOSS OR DAMAGE TO THE UNIT OCCASIONED BY ANY OF THE FOLLOWING PERILS: -

1. RIOT, CIVIL COMMOTION OR ANY CONSEQUENCE OF WAR OR INVASION.
2. ACTS OF GOD.
3. THEFT OR LARCENY.

IMPORTANT

This warranty is in addition to all other rights and remedies available to the consumer under the Trade Practices Act 1974 as amended and other relevant State and Territory laws and shall not be taken as applying to exclude, restrict or modify such rights or remedies in any manner whatsoever.

Where the unit is of a kind not ordinarily acquired for personal, domestic or household use, then the liability of the Company for breach of any condition or warranty implied by the aforementioned statutes (other than a condition or warranty implied by Section 69 of the Trade Practices Act or any corresponding Section on any other enactment in any State or Territory for the time being enforced) is limited to any one or more of the following as the Company decides: -

1. The replacement of the unit or the supply of an equivalent unit;
2. The repair of the unit;
3. The payment of the cost of replacing the unit or of acquiring an equivalent unit;
4. The payment of the cost of having the unit replaced.

6b: Items Not Covered By Warranty

- ◊ Service calls due to:
 - Dirty Filters.
 - Blown Fuses
 - Incorrect Operation.
 - Tripped Circuit Breakers.
 - Main Isolator Switched Off.
 - Blocked Drains (such as from the Evaporator etc).
- ◊ Failure to start due to voltage conditions or other damage due to inadequacy or interruption of electrical service.
- ◊ Damage caused by accident, misapplication, and abuse or tampering.
- ◊ Damage caused by use in a corrosive atmosphere (e.g. such as coastal regions).
- ◊ Filter cleaning and / or replacement, unless defective.
- ◊ Cleaning / maintenance of the water heater unit.
- ◊ Calls made to check the operation of a unit, which is found to be working satisfactorily.
- ◊ Remounting or relocating equipment due to ground subsidence.
- ◊ Modifications to the system after installation due to changes in requirements.
- ◊ Relocation of equipment due to complaints of noise level or inappropriate location.

No responsibility shall be accepted for damage to the system or property, if it is found that continued use of a faulty system has occurred.

No responsibility shall be accepted for delays due to: -

- Unavailability of parts from suppliers.
- Delays due to unusually high demand for service.

6c: Before Phoning For Service

Please check the following: -

- Have all the above mentioned items been checked and adhered to?
- Have you read through all items in this manual?
- Has the main isolation switch / circuit breaker / water heating switch been turned on?
- Have any fuses in the switchboard blown?
- Is the circuit breaker on the side of the heater unit (under Digital Controller) turned on?
- Is sufficient water flowing through the heater (i.e. water pressure switch closed)?

Warranty shall be carried out during normal business hours 08:00 hours (08:00 AM) to 16:30 hours (04:30 PM) Monday to Friday. Warranty covers travel within a 50-km distance from the place of purchase, distributor or service agent's premises. Any additional travel costs are at the expense of the customer.



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NOTE: While every care has been taken to ensure the accuracy in preparing this publication,
No liability can be accepted for any consequences, which may arise as a result of its application.

Quantum: Hot Water From Thin Air!